

Vitamin D Deficiency - Management guidelines for adults and children SWL

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Key Messages

- Sufficient levels of vitamin D are required for optimal bone and musculoskeletal health. The Scientific Advisory Committee on Nutrition (SACN) and Royal Osteoporosis Society (ROS) advise that the risk of poor musculoskeletal health is increased at vitamin D levels below 25 nmol/L:
 - Less than 25 nmol/L — diagnose vitamin D deficiency
 - 25–50 nmol/L — insufficient for some patients
 - Greater than 50 nmol/L — sufficient for most patients
- It is recommended that the serum 25(OH)D concentration of all individuals should not fall below 25 nmol/L at any time of the year.
- Routine vitamin D testing is not recommended to screen the normal population for deficiency.
- Routine testing vitamin D levels in patients at high risk of vitamin D deficiency is NOT recommended unless they show symptoms of deficiency.
- Give lifestyle advice on safe sun exposure, dietary intake, and vitamin supplementation to all patients as well as the 'Information on Vitamin D' [patient leaflet](#).
- In line with the SWL ICB [position statement](#) on vitamin D, the prescribing of vitamin D is not recommended in the following circumstances, and should be purchased over the counter if required:
 - For prophylaxis or maintenance after treatment of deficiency or insufficiency
 - For asymptomatic patients that are at risk of vitamin D deficiency
 - For prophylaxis in babies and children up to 4 years, regardless of whether they are breastfed/formula fed and receiving less than 500ml of formula milk, as it is recommended that vitamin D is purchased
 - In addition, infants receiving more than 500ml of infant formula a day should not be given additional vitamin D, as infant formula is fortified with vitamin D.
- The evidence base for treating patients with non-musculoskeletal conditions (e.g. COPD, Covid-19) is uncertain. Only treat patients who have a disease that is caused by vitamin D deficiency, or when vitamin D deficiency may contribute to an increased risk of that condition.
- The oral administration is recommended in preference to the parenteral route due to less variability in absorption.
- In primary care, prescribe treatment courses of vitamin D as an acute prescription by BRAND for the whole course. Thereafter, maintenance should be purchased over the counter in line with the [SWL self care position statement](#).
- If a loading course is initiated in hospital, the **full course** is to be supplied on discharge by the Acute Trust.
- Prescribing of combination calcium and vitamin D preparations which contain low levels of vitamin D, are not sufficient to treat vitamin D deficiency.
- Routinely retesting vitamin D levels after completing a treatment course is not normally necessary. However, it may be indicated for some patient groups such as those with osteoporosis at high risk of fracture.
- Check adjusted serum calcium 1 month after completing the last dose of loading regimen, or after starting vitamin D supplementation to detect patients in whom primary hyperparathyroidism has been unmasked.

1. Introduction & Scope

This guideline only relates to the management of vitamin D deficiency to promote optimal bone health, and does not address the use of vitamin D for other potential non-musculoskeletal indications, such as primary hyperparathyroidism, sarcoidosis. Routine treatment of patients with these conditions is not justified.

Low vitamin D status has been associated with some non-musculoskeletal conditions such as diabetes, COPD, auto-immune disease, mental health problems, cardiovascular disease, and some cancers. As the evidence for these is inconsistent, conflicting, or absent, it remains uncertain whether correcting vitamin D deficiency will improve outcomes in these conditions.

There is no evidence to support taking vitamin D supplements to specifically prevent or treat [COVID-19](#). However, everyone should continue to follow UK government advice on vitamin D supplementation to maintain bone and muscle health.

Specialist advice should be sought for the management of vitamin D deficiency in patients with severe or end-stage chronic kidney disease (CKD 4-5), severe liver disease, malabsorption syndromes, unexplained bone pain, unusual fractures, and other evidence of metabolic bone disorders.

There is currently no UK guidance on managing vitamin D deficiency in pregnancy, therefore the management of vitamin D Deficiency in pregnant women is outside the scope of this document. Clinicians may wish to seek specialist advice prior to treating Vitamin D deficiency in this group as appropriate.

This guidance should be read in conjunction with the SWL position statements on [Self care and OTC products](#) and [Vitamin D](#).

2. Recommended Daily Intake

[Public Health England](#) (PHE) recommends that in the autumn and winter months (October to March) everyone should consider taking a daily supplement containing 10 micrograms (400units) to 25 micrograms (1000units) of vitamin D to help keep bones, teeth, and muscles healthy.

[Patients at risk of vitamin D deficiency](#), who do not have a disease with outcomes that may be improved with vitamin D treatment, or symptoms that could be attributed to vitamin D deficiency, are advised to take a Vitamin D supplement dose of 10 micrograms (400units) to 25 micrograms (1000units) once daily, all year round. This includes pregnant and breastfeeding women for the duration of their pregnancy/breastfeeding period.

Adults who have previously received treatment for vitamin D deficiency or insufficiency will require more vitamin D, usually 20-50micrograms (800units-2,000units) a day. If a patient has previously received prescriptions for 20micrograms (800units) of Vitamin D, it is acceptable for them to buy a 25micrograms (1,000units) vitamin D supplement instead, if this strength is more readily available. Patients with certain conditions such as malabsorption may require higher maintenance doses up to a maximum of 4000units daily following specialist advice.

For all children aged 1 month to 18 years, including those at high risk of vitamin D deficiency, daily supplementation of 400-600units is recommended. [PHE](#) recommends that babies are exclusively breastfed until around 6 months of age. As a precaution, all babies under 1 year should have a daily 8.5-10 micrograms (340 to 400units) vitamin D supplement to ensure they have sufficient levels. Children who have more than 500ml of infant formula a day do not need any additional vitamin D, as formula is already fortified.

Give all patients lifestyle advice on preventing vitamin D deficiency (safe sun exposure, dietary sources and vitamin supplementation). The [patient information leaflet](#) contains comprehensive information about vitamin D. Give this to patients to reinforce and supplement verbal advice.

Vitamin D3 Supplements (colecalciferol)

A range of supplements are available for purchase from pharmacies, health food stores and supermarkets in

store and online. Patients who need advice on which preparation to purchase should be directed to speak with their community pharmacist.

Pregnant women, women with a child under 12 months, and children aged up to 4 years who are receiving [Healthy Start](#) vouchers are entitled to free Healthy Start vitamins. Health care professionals are advised by PHE to increase awareness of the availability and eligibility for local schemes providing vitamin D.

Calcium Supplements

It is important to promote the relevance of adequate dietary calcium intake alongside vitamin D supplementation⁵. There are 'calcium calculators' to help patients and clinicians to determine individual requirement e.g. from the [University of Edinburgh](#). If the patient is unable or unwilling to increase their dietary calcium, consider the need for supplemental calcium.

3. Patient Groups at Risk of Vitamin D Deficiency

Vitamin D supplementation is recommended in the following groups, as they are at risk of vitamin D deficiency:

- Infants and children under 5 years of age
- All pregnant and breastfeeding women, particularly teenagers and young women
- Patients aged 65 years and over
- Patients who are not exposed to much sun (e.g., housebound individuals, those confined indoors for long periods (prison) and those who cover their skin for cultural reasons)
- Patients with pigmented skin (includes patients of African, African-Caribbean and South Asian family origin).

There may be other circumstances that could put patients at risk of vitamin D deficiency, such as:

- Inadequate dietary intake (e.g., vegan or strict vegetarian diet)
- Conditions that impair the absorption of vitamin D (e.g., coeliac disease, cystic fibrosis, Crohn's disease, post bariatric surgery)
- Obesity
- Conditions that impair the activation of vitamin D (e.g., chronic liver or renal disease)
- Nephrotic syndrome
- Cancers (malignant or benign)
- Certain medications: Drugs that actively destroy vitamin D by activating its metabolism such as:
 - antiepileptics (especially carbamazepine, phenytoin, phenobarbitone) and rifampicin, corticosteroids (taken for 3 months or longer), and highly active antiretroviral treatment (HAART)
 - Colestyramine, colestipol, laxatives, liquid paraffin and sucralfate may reduce intestinal absorption of vitamin D. Drugs that reduce fat absorption (for example, orlistat) can lead to a decreased bioavailability of vitamin D
 - This list is not exhaustive. See [British National Formulary \(BNF\)](#) and [NICE CKS](#) for more information.

4. Testing and Diagnosis of Vitamin D Deficiency

Routine vitamin D testing is not recommended to screen the normal population or those at high risk of Vitamin D deficiency, unless symptomatic.

Vitamin D testing should be considered in the following:

- **Patients with a disease where outcomes may be improved with sufficient vitamin D levels (> 50nmol/L)**
 - Paget's disease
 - Osteomalacia
 - Osteoporosis, osteopenia and fragility fractures
 - As recommended by [NICE](#), if starting an oral bisphosphonate for these patients, vitamin D

levels should be checked and corrected prior to prescribing.

- Monitoring vitamin D level is not necessary where oral bisphosphonates with vitamin D supplementation (\pm calcium) have been prescribed. However, testing may be appropriate for patients that sustain a fragility fracture despite adhering to treatment, or where fracture healing is delayed.

➤ **Patients with symptoms that could be attributed to vitamin D deficiency (especially if patients are in high-risk groups)**

- Insidious onset of widespread or localised bone pain and tenderness (especially lower back and hip pain, but may include rib, thigh or foot pain)
- Proximal muscle weakness, swelling, tenderness and redness at pseudo-fracture sites
- Patients with features of hypocalcaemia (rare), including muscle cramps, carpedal spasm, numbness, paraesthesias, tetany or seizures (especially in children)
- Cardiomyopathy (in infants)
- Child or young person presenting with symptoms and signs of rickets
- Non-specific myalgia especially with a raised Creatine Kinase (CK)
- Other causes for symptoms should be excluded (e.g., myeloma, rheumatoid arthritis, polymyalgia rheumatic, hypothyroidism).

➤ **Patients where rapid correction of Vitamin D is required prior to specific treatment**

- Patients starting on a potent anti-resorptive agents (e.g., IV Bisphosphonate/ Teriparatide/ Denosumab). The recommended treatment regimen would be based on [fixed loading doses](#) followed by regular maintenance therapy. If vitamin D correction is required for such patients, treatment would be advised by a specialist.

Diagnosis of vitamin D deficiency

If testing for vitamin D deficiency is indicated, check the vitamin D level by measuring serum 25-hydroxyvitamin D (25D).

The Scientific Advisory Committee on Nutrition (SACN) and Royal Osteoporosis Society (ROS) advise that the risk of poor musculoskeletal health is increased at vitamin D levels below 25 nmol/L:

- Less than 25 nmol/L — diagnose vitamin D deficiency
- 25–50 nmol/L — insufficient for some patients
- Greater than 50 nmol/L — sufficient for most patients

If deficiency or insufficiency is diagnosed, further tests may be indicated to:

1) Assess for a disorder of bone mineralization, such as:

- Bone profile (calcium, phosphate, and alkaline phosphatase [ALP])
- Parathyroid hormone (PTH) level

2) To assess for an underlying cause or alternative condition that may be causing symptoms, depending on clinical judgement, such as:

- Renal function (Urea and Electrolytes, Creatinine, eGFR)
- Liver function
- Full blood count

5. Management of Vitamin D Deficiency in Adults and Children

Treatment

Refer to the flowcharts for guidance on oral treatment of vitamin D deficiency in [adults](#), and [children](#). Additional product information for patients with dietary or religious requirements can be found in [Appendix I](#)

Please check the [BNF/ Summary of Product Characteristics \(SPC\)](#) for full details on individual drug interactions prior to prescribing vitamin D.

Consider seeking specialist advice (using clinical judgement to decide on the urgency) if the patient:

- Has a medical condition that predisposes to hypercalcaemia (e.g., sarcoidosis, tuberculosis, metastatic bone disease, some lymphomas, primary hyperparathyroidism)
- Has a gastrointestinal or malabsorption disorder
- Has severe liver disease
- Has end stage chronic kidney disease (stage 4 CKD or eGFR <30ml/minute)
- Has active renal stones or a history of renal stones
- Has contraindications to vitamin D (refer to product [SPC](#) for further information)
- Has no response after 12 weeks of treatment (exclude non-compliance causes)
- Is pregnant or breastfeeding

Prescribing Considerations

Prescription

- In primary care, prescribe a licensed preparation by **BRAND** as an **ACUTE** prescription for the **FULL** treatment course, in order to avoid inadvertent repeat prescribing.
- If a loading course is initiated in hospital, the **FULL** course is to be supplied on **DISCHARGE** by the Acute Trust.

Product Choice

- Ensure a licensed preparation is chosen in the first instance before considering an unlicensed preparation. Prescribing of unlicensed preparations should only be undertaken in exceptional circumstances to meet the specific needs of an individual.
- If the dose recommended in this guideline differs from that specified by the SPC, this would be considered as off-label prescribing. Please refer to the [General Medical Council](#) for further information on prescribing unlicensed medicines and off-label.
- Use of an oral single mega-dose (300,000units or higher) for loading patients, has been shown to be either ineffective or associated with higher rates of falls and fractures. In the absence of further studies, such single-loading-dose strategies are not recommended.
- Prescribing of combination calcium and vitamin D preparations which contain low levels of vitamin D, are not sufficient to treat vitamin D deficiency.
- Alfacalcidol and calcitriol should not be used for the routine treatment of primary vitamin D deficiency, as unlike vitamin D, they carry a higher risk of toxicity and require long term monitoring.
- There are no available licensed preparations suitable for vegan patients. This patient group should be educated on the need to include foods fortified with vitamin D within their diet. Further information can be found on the [NHS website](#).

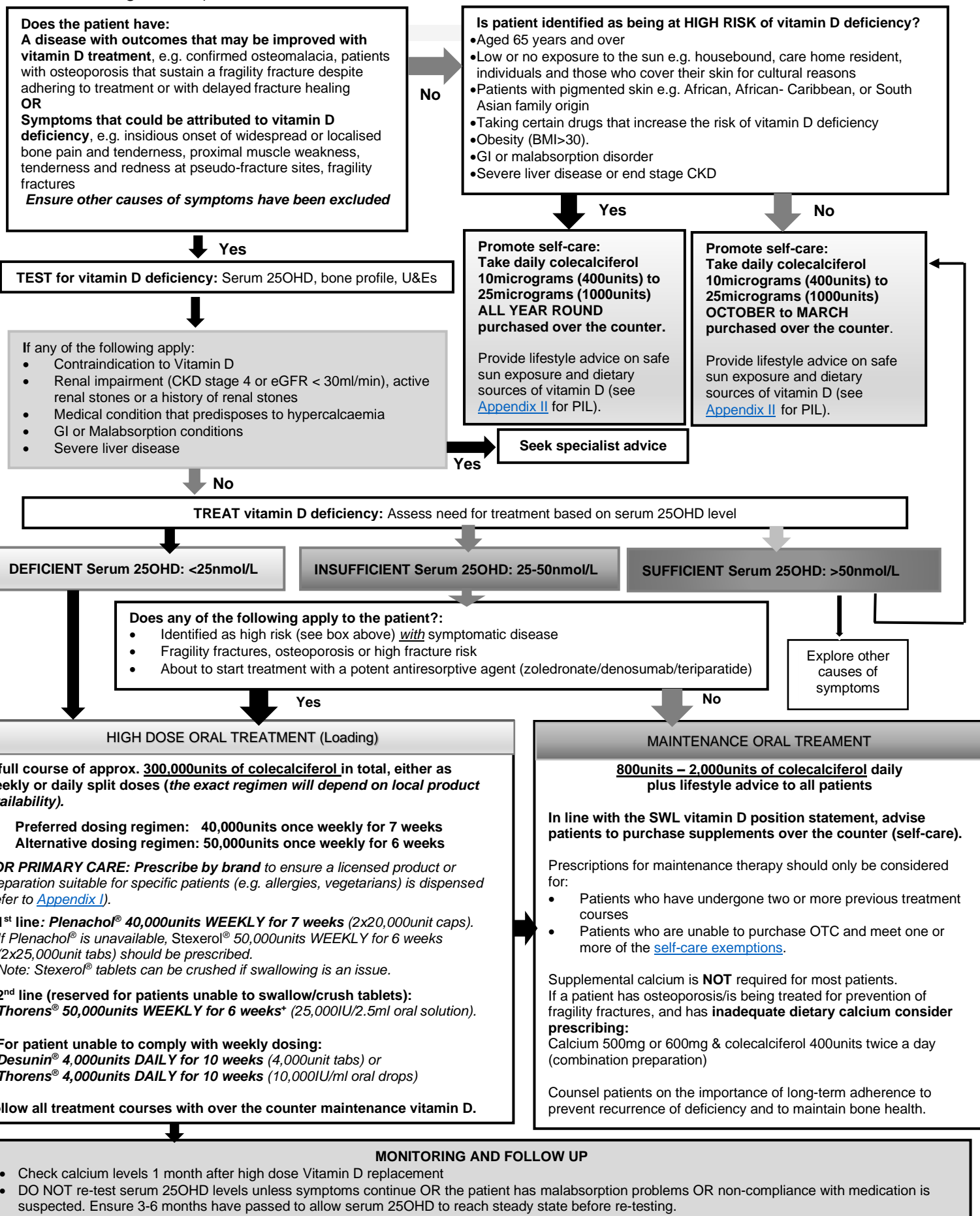
Administration

- The oral route is recommended in preference to the parenteral route. The prescribing of intramuscular (IM) vitamin D preparations is hospital only across SWL.
- As a fat-soluble vitamin, oral vitamin D preparations should preferably be taken with a meal, to aid absorption.
- Some tablet formulations can be crushed before taking for patients with swallowing difficulties (off-label use of the drug).

Adverse Effects and Toxicity

- Known adverse effects include hypersensitivity reactions, itching, rash, urticaria, hypercalcaemia and hypercalciuria. Refer to individual [SPCs](#) for further information or [ROS](#).
- Toxicity is rare and is unlikely to occur with recommended supplemental or therapeutic doses.
 - Early signs of toxicity include symptoms of hypercalcaemia (e.g. apathy, anorexia, constipation, diarrhoea, dry mouth, fatigue, headache, nausea and vomiting, thirst, and weakness).
 - Later symptoms are often associated with calcification of soft tissues and include bone pain, cardiac arrhythmias, hypertension, renal damage (increased urinary frequency, decreased urinary concentrating ability, nocturia, proteinuria), psychosis (rare) and weight loss.
 - The treatment of toxicity consists of stopping vitamin D and calcium supplements and rehydrating the patient.

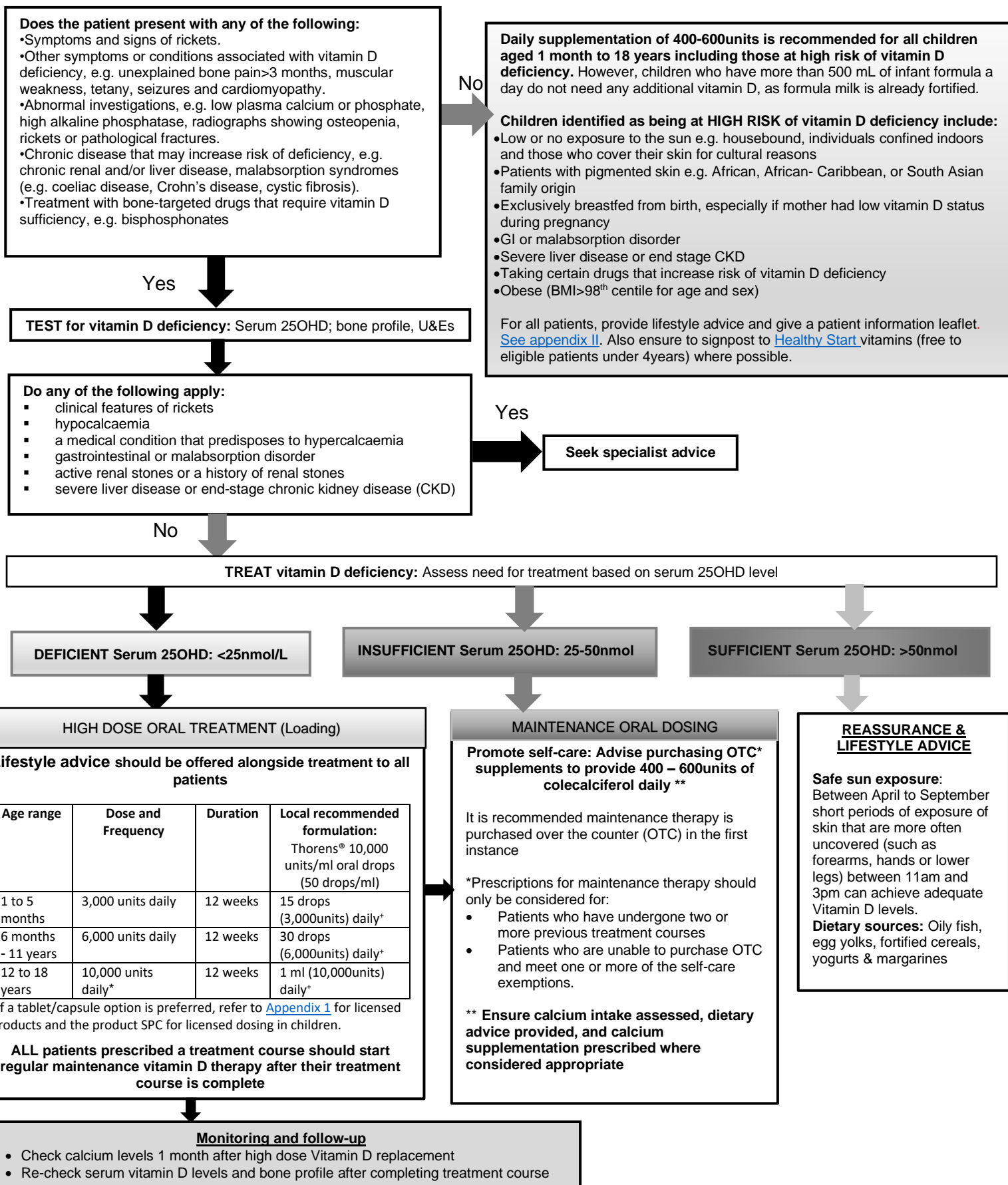
5a. Management of Vitamin D Deficiency in Adults (NICE CKS & ROS)- (excluding pregnant and breastfeeding women)



*Off-label dosing. Refer to ROS. Not all products have UK marketing authorisation (MA) for use at all dosages or in all ages: if considering prescribing outside the terms of its MA, the prescriber takes full prescribing responsibility. Obtain and document informed consent. For licensing and further information on any drugs, see Summary of Product Characteristics (SPC) or current BNF.

5b. Management of Vitamin D Deficiency in Children (NICE CKS & ROS)- (excluding pregnant and breastfeeding patients)

Pre-term babies with Vitamin D deficiency should be assessed by a paediatric specialist who will prescribe and monitor.



+Unlicensed/Off-label dosing. Refer to ROS. Not all products have UK marketing authorisation (MA) for use at all dosages or in all ages: if considering prescribing outside the terms of its MA, the prescriber takes full prescribing responsibility. Obtain and document informed consent. For licensing and further information on any drugs, see Summary of Product Characteristics (SPC) or current BNF.

6. Follow-up After Treatment With High-Dose Vitamin D (Adults and Children)

Calcium status

The Royal Osteoporosis Society recommend checking adjusted serum calcium 1 month after completing the last dose of a loading regimen or after starting lower dose vitamin D supplementation, to detect patients in whom primary hyperparathyroidism has been unmasked.

Consider checking serum calcium levels more regularly in patients with risk factors for hypercalcaemia such as:

- Taking calcium supplements in addition to high-dose vitamin D treatment
- Chronic Kidney Disease (CKD) or those taking thiazide diuretics
- Taking digoxin or other cardiac glycosides
- Symptoms or signs of hypercalcaemia (anorexia, nausea, thirst, polyuria, vomiting, constipation, confusion).

Hypercalcaemia management

- Advise patient to stop vitamin D and/or calcium supplements.
- Assess the patient's hydration state and manage appropriately if the patient is dehydrated.

Hypocalcaemia management

- Review dietary intake of calcium and give advice on how to increase dietary intake where necessary. If the patient is unable or unwilling to increase their dietary calcium intake, consider the need for calcium supplements. This may be needed long term (in addition to vitamin D maintenance treatment), for patients with inadequate dietary calcium intake.
- If the patient is already taking a calcium supplement, consider seeking specialist advice.

Vitamin D status

There is no need to routinely re-test vitamin D levels after a treatment course.

Only re-test 3-6 months after initiation of vitamin D treatment to ensure adequate time has been given to allow 25(OH)D levels to reach steady state.

Re-testing may be indicated if any of the following apply:

- Symptomatic vitamin D deficiency
- Malabsorption disorder
- Poor compliance with medication is suspected
- Prescribed antiresorptive therapy (zoledronate, denosumab, or teriparatide) who have extremely low levels of vitamin D at baseline assessment
- Needing sequential doses of a potent antiresorptive agent (zoledronate, denosumab or teriparatide):
 - If serum 25(OH)D levels < 50 nmol/L, assess adherence to treatment and/or seek specialist advice where necessary to investigate possible causes.
 - If serum 25(OH)D levels > 50 nmol/L and there are no signs of hypercalcaemia, recommend lower end of maintenance dose of vitamin D.

7. Maintenance / Prophylaxis of Vitamin D Deficiency

In line with the SWL position statement on vitamin D, the prescribing of vitamin D is not recommended in the following circumstances:

- For prophylaxis or maintenance following treatment of deficiency or insufficiency in symptomatic individuals
- For asymptomatic patients that are at high or normal/low risk of vitamin D deficiency
- For prophylaxis in babies and children up to 4 years, regardless of whether they are breastfed/formula fed or receiving less than 500ml of formula milk, as it is recommended that vitamin D is purchased. In addition, infants receiving more than 500ml of infant formula a day should not be given additional vitamin D, as infant formula is fortified with vitamin D.

It may be appropriate for certain patients to receive a NHS prescription for prophylaxis or maintenance of vitamin D. When considering such cases, read the [vitamin D](#) and the [self-care](#) position statements together, to assess whether patients meet one or more of the exemptions.

Maintenance after a treatment course

Advise patients to purchase vitamin D supplements for maintenance. Maintenance treatment on the NHS may be considered for patients who have successfully completed two or more previous treatment courses, and in other special/high-risk groups. For further information, please refer to the SWL position statement on [self-care guidance](#).

Patients currently prescribed prophylaxis or maintenance vitamin D

Patients currently prescribed vitamin D maintenance on an NHS prescription should be reviewed. Discontinue the prescription unless a clinical assessment indicates that continuous treatment on prescription is justified. Provide the '[Patient Information on Vitamin D](#)' leaflet ensuring the appropriate advice is given to the patient on their vitamin D maintenance dose and reinforce lifestyle advice.

8. References

1. Scientific Advisory Committee on Nutrition (SACN) (July 2016). Vitamin D and Health Report for Public Health England. Available via: <https://www.gov.uk/government/news/phe-publishes-new-advice-on-vitamin-d>
2. National Institute for Clinical Excellence (NICE) Public Health Guideline (August 2017). Vitamin D: supplement use in specific population groups (PH56). Available at: <https://www.nice.org.uk/guidance/ph56>
3. NICE CKS (September 2021 -Last revised January 2022) Vitamin D deficiency in adults - treatment and prevention. Available at: <https://cks.nice.org.uk/topics/vitamin-d-deficiency-in-adults/>
4. NICE CKS. (April 2021 -Last revised January 2022) Vitamin D deficiency in children. Available at: <https://cks.nice.org.uk/vitamin-d-deficiency-in-children>
5. Royal Osteoporosis Society (2020). Vitamin D and bone health: a practical clinical guideline for patient management. Available at: <https://theros.org.uk/media/ef2ideu2/ros-vitamin-d-and-bone-health-in-adults-february-2020.pdf>
6. Royal Osteoporosis Society (2018). Vitamin D and bone health: a practical clinical guideline for management in children and young people. Available at: [ros-vitamin-d-and-bone-health-in-children-november-2018.pdf](https://theros.org.uk/media/ef2ideu2/ros-vitamin-d-and-bone-health-in-children-november-2018.pdf) (theros.org.uk)
7. The Royal College of Paediatrics and Child Health. Vitamin D for infants, children and young people – guidance on website: <https://www.rcpch.ac.uk/resources/vitamin-d-infants-children-young-people-guidance>
8. South West London Position statement on the prescribing of vitamin D <https://swlimo.southwestlondon.icb.nhs.uk/policies/position-statements/>
9. South West London Position Statement for prescribing preparations available to buy over the counter (OTC) for self-care. <https://swlimo.swlondonccg.nhs.uk/policies/position-statements/>
10. NICE Evidence Summary ES28. COVID-19 rapid evidence summary: Vitamin D for COVID-19 <https://www.nice.org.uk/advice/es28>
11. Healthy Start; Vitamins: www.healthystart.nhs.uk
12. Specialist Pharmacy Service Dosing and monitoring for treatment of Vitamin D deficiency in pregnancy (December 2021): <https://www.sps.nhs.uk/articles/dosing-and-monitoring-for-treatment-of-vitamin-d-deficiency-in-pregnancy/>
13. Personal communication with Accord UK Ltd (Plenachol) on 2/11/21
14. Personal communication with Consilient Health (Invita D3) on 2/11/21
15. Personal communication with Almac Group (Thorens) on 2/11/21
16. Personal communication with Thornton & Ross Ltd (Fultium D3) on 3/11/21
17. Personal communication with Sunvit-D3 Ltd on 8/11/21 and 9/11/21
18. Personal communication with Synergy Biologics (Pro D3) on 8/11/21
19. Personal communication with Strides Pharma UK Ltd (Strivit D3) on 11/11/21 and 30/11/21
20. Royal Osteoporosis Society. Calcium supplementation: <https://theros.org.uk/information-and-support/bone-health/nutrition-for-bones/calcium/>
21. University of Edinburgh, Calcium calculator: <https://webapps.igmm.ed.ac.uk/world/research/rheumatological/calcium-calculator/>
22. Vitamins for children - www.nhs.uk/conditions/baby/weaning-and-feeding/vitamins-for-children/
23. Interface prescribing policy – South West London Clinical Commissioning Group <https://swlimo.swlondonccg.nhs.uk/policies/interface-prescribing-policy/>

24. New national osteoporosis guidance—implications for geriatricians April 2022: [New national osteoporosis guidance—implications for geriatricians | Age and Ageing | Oxford Academic \(oup.com\)](#).

Appendix I: SWL Formulary Vitamin D preparations - information correct at time of publication*

Treatment of Deficiency in Adults	Name and form	Suitable for				Preparation contains				Licensed age in Children
		Halal	Kosher	Vegetarian	Vegan	Soya	Nuts	Gelatin	Lactose	
(Serum 25OHD: <25nmol/L)	Stexerol® D3 25,000 IU tablets	Yes	Yes	Yes	No	No	No	No	No	>12 years
	Thorens® 25,000 IU /2.5ml solution	Yes	Yes	Yes	No	No	No	No	No	>18 years
	Desunin® D3 4000 IU tablets	No	No	Yes	No	No	No	No	No	>12 years
	Strivit® D3 20,000 IU capsules	Yes	Yes	Yes*	No	No	No	Yes	Yes	>12 years
	Plenachol® D3 20,000 IU capsules	Yes	Yes	Yes**	No	No	No	No	No	>12 years
	Plenachol® D3 40,000 IU capsules	Yes	Yes	Yes**	No	No	No	No	No	>12 years
	Stexerol® D3 1000 IU tablets	Yes	Yes	Yes	No	No	No	No	No	>12 years
Treatment of Insufficiency in high risk adults: Maintenance (if unable to buy OTC) in Adults (Serum 25OHD: 25-50nmol/L)	Desunin® D3 800 IU tablets	No	No	Yes	No	No	No	No	No	>12 years
	Invita® D3 800 IU capsules	Yes	Yes	No	No	No	No	Yes	No	>12 years
	Invita® D3 400 IU capsules	Yes	Yes	No	No	No	No	Yes	No	>12 years
	Strivit® D3 800 IU capsules	Yes	Yes	Yes*	No	No	No	Yes	Yes	>12 years
	Fultium® D3 2740IU/ml oral drops	Yes	Yes	Yes	No	No	No	No	No	From birth
Treatment of Deficiency in Children (Serum 25OHD: <25nmol/L)	Invita® D3 2400IU /ml	No	No	Yes	No	Yes	Yes	No	No	From birth
	Thorens® 10,000 IU /ml oral drops	Yes	Yes	Yes	No	No	No	No	No	From birth
	Dalivit® (400 IU)	Yes	Yes	Yes	No	No	No	No	No	>6 weeks old
Treatment of insufficiency in high risk children: Maintenance (if unable to buy OTC) in Children (Serum 25OHD: 25-50nmol/L)	Healthy Start Vitamin oral drops	Yes	Unknown	Yes	No	No	No	No	No	>4 weeks old
	Fultium® D3 2740IU/ml oral drops	Yes	Yes	Yes	No	No	No	No	No	From birth
	Invita® D3 400 IU capsules	Yes	Yes	No	No	No	No	Yes	No	>10 years
	Pro D3® 20,000IU vegan capsules	Yes	Yes	Yes	Yes	No	No	No	No	N/A (food supplement)
Treatment of Deficiency in VEGAN Adults (Serum 25OHD: <25nmol/L)	Pro D3® 3,200IU vegan capsules	Yes	Yes	Yes	Yes	No	No	No	No	N/A (food supplement)

*Note: Manufacturers may change the formulation of their products or the suppliers of the excipients and cannot guarantee products may come into contact with allergens during transit. The current status of the peanut or soya content of the product should therefore be obtained from the manufacturer. Halal or kosher certification is dependent on information supplied by product manufacturers and may be subject to change. It is recommended that individuals verify information on each product with the manufacturers, it would remain the patient's decision as to whether the ingredients are acceptable under their vegan/vegetarian dietary guidelines. The information and pricing in this guidance is correct at the time of publishing.

+Product has a European Certificate of suitability for vegetarians; however, product contains lime boned bovine gelatin. This is not a meat sourced gelatin however; it would remain the patient's decision as to whether the ingredients are acceptable.

++ Product does not have a Certificate of suitability for vegetarians; however, product derived from the lanolin of sheep's wool. This recommendation is based on the information available on the [Specialist Pharmacy Service website](#). It would remain the patient's decision as to whether the ingredients are acceptable.

PATIENT INFORMATION ON VITAMIN D

This leaflet explains the importance of vitamin D for maintaining good bone health, and the changes to the availability of vitamin D supplements for adults and children on NHS prescription.

Why do we need Vitamin D?

Vitamin D (also called Vitamin D3 or colecalciferol) is important for bone health. It is needed to absorb calcium, phosphate and other nutrients from our diet and helps to keep bones strong and healthy.

Where do we get Vitamin D from?

Sunlight

Around 90% of the vitamin D we require is made when our skin is exposed to direct ultraviolet B (UVB) rays from sunlight. Darker skin needs more sun to get the same amount of vitamin D than lighter skin.

- The sunlight needed must fall directly on to bare skin (through a window is not enough).
- 2-3 exposures of sunlight per week in the spring and summer months (April to September) is enough to achieve healthy vitamin D levels through the year.
- Sunbeds are **not** a recommended source of vitamin D.
- Each episode should be around 15 minutes to uncovered arms and face, without sunscreen (many moisturisers and cosmetics contain sunscreen). This is not the same as sun tanning; the skin simply needs to be exposed to sunlight. Remember it is important to cover up or protect the skin if it starts to turn red or burn. The sun's rays can be damaging, and sunburn should be avoided at all costs, due to the increased risk of skin cancer.

Diet

A small amount of Vitamin D comes from the food we eat.

- Between October and early March, there is generally not enough sunlight to maintain adequate vitamin D levels, and so we need to rely on dietary sources of vitamin D and supplements.
- Foods that contain Vitamin D include oily fish (e.g., sardines, herring, salmon and mackerel), red meat, liver, egg yolk, tofu, mushrooms.
- In the UK, some margarine, soya products, breakfast cereals, orange juice and infant formula milk are fortified with vitamin D. It is important to check the content of vitamin D in fortified foods to ensure recommended daily intake is being reached. Children who have more than 500ml of infant formula a day do not need any additional vitamin D as formula milk is already fortified.

N.B. Food sources alone may not provide sufficient Vitamin D during the winter months and so Vitamin D supplements are recommended for everyone, at least during autumn/ winter. Children under 5 years and other risk groups are advised to take supplements all year round.

Supplements – See next page “How much Vitamin D should I take?” section

Vitamin D Deficiency Risk Groups

Some people are at greater risk of vitamin D deficiency than others. This may be because their bodies need more vitamin D, they cannot produce enough through their skin, their diet is low in vitamin D, or a combination of all the above. High risk groups include:

- Pregnant or breastfeeding women
- People under 5 years or 65 years and older
- Limited sun exposure e.g., the housebound or people in institutions such as a care home
- People whose clothing covers up most of their skin when outdoors
- Ethnic groups with dark skin
- People who follow a strict vegetarian or vegan diet
- People who are obese or significantly overweight
- Certain medicines may reduce your vitamin D levels (e.g. medicines for epilepsy or HIV, rifampicin or cholestyramine)

How will I know if my vitamin D levels are low?

Testing of vitamin D levels is not routinely offered. In the UK, without supplementation most people will have low Vitamin D levels during the winter months. Your GP may check your blood levels if you have symptoms of vitamin D deficiency or have risk factors that may affect the health of your bones.

What happens if you do not have enough vitamin D?

Low vitamin D may not cause any symptoms. However, some people may have symptoms such as tiredness, and general aches and pains. A severe lack of vitamin D, known as vitamin D deficiency, can cause bones to become soft and weak, which can lead to bone deformities. In adults, it can lead to osteomalacia, which causes bone pain and tenderness. In children, it can increase the risk of developing rickets. For further information refer to <http://patient.info/health/vitamin-d-deficiency-including-osteomalacia-and-rickets-leaflet>

How much Vitamin D should I take?

Public Health England recommends that in the autumn and winter months (October to March) **EVERYONE** should consider taking a daily supplement containing 10 micrograms (400 units) of vitamin D. These can be purchased; you do not need a prescription. For further NHS advice refer to <https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/>

If you fall within a risk group for vitamin D deficiency (see above), then it is recommended that you consider taking a Vitamin D supplement dose of 10micrograms (400units) once daily, all year round.

Adults who have previously received treatment for vitamin D deficiency or insufficiency will require more vitamin D, usually 20-50micrograms (800units—2,000units) a day. If you have previously received prescriptions for 20micrograms (800 units) of Vitamin D, it is acceptable to buy a 25micrograms (1,000unit) vitamin D supplement instead, if this strength is more readily available.

Children who have previously received treatment for Vitamin D deficiency or insufficiency will require more Vitamin D, usually 10-15micrograms (400-600units) a day.

Where to get Vitamin D supplements

There are a wide range of Vitamin D supplements available to buy at low cost from pharmacies, most supermarkets and health food shops. For maintaining good teeth and bone health **a product that contains 10-25micrograms i.e. (400units to 1,000units) of Vitamin D is generally advised.**

Eligible women who are pregnant or breastfeeding and children under the age of 4 years may be able to get free Healthy Start vitamins tablets that contain 10micrograms (400 units) of vitamin D from some baby clinics and children's centers. Speak to your midwife or health visitor for more information, or alternatively visit www.healthystart.nhs.uk.

Can I get Vitamin D on prescription?

GP practices in South West London will no longer routinely prescribe maintenance vitamin D supplements. This is in line with NHS guidance.

If you require a treatment course of high dose vitamin D (usually 8-12weeks) to replenish your vitamin D levels, this will be given on prescription. Once the treatment course is completed, you will be advised to buy low dose vitamin D supplements long-term, to prevent future episodes of deficiency.

Are there any risks with Vitamin D?

Although the risk of having too much vitamin D is extremely rare, you are advised to check with a health professional such as a pharmacist, before you start taking vitamin D supplements. This is particularly important if you are already taking or have been advised to take other supplements (e.g., folic acid in pregnancy) as the pharmacist can help you select a product that meets all of your health needs. Do not take more than 4000 units daily unless under specialist advice.